NOTES.

We notice with much regret that among the victims of the sinking of the Irish mail-boat *Leinster*, which was torpedoed by a German submarine on October 10, was Sir W. H. Thompson, K.B.E., King's professor of Institutes of Medicine, Trinity College, Dublin, and scientific adviser to the Ministry of Food.

Dr. Raymond Pearl has resigned his position of biologist of the Maine Agricultural Experiment Station, Orono, Maine, having been appointed professor of biometry and vital statistics in the school of hygiene and public health, Johns Hopkins University.

A branch of the National Union of Scientific Workers was formally constituted at Liverpool at a meeting held at the University on October 10. The branch resolved to give general support to any schemes of federation of existing organisations of workers in science and technology, and decided on representation at the general meeting of the union.

Prof. W. A. Bone, with the concurrence of the authorities of the Imperial College of Science and Technology, has asked to be relieved of his duties as consultant to the Fuel Research Board on October 22, in order to be free during the coming winter to devote his attention to plans now under consideration for the post-war development of the department of chemical technology at the college.

The American Academy of Medicine is offering a prize to be awarded in 1921 for an essay from a fund raised in honour of Dr. C. McIntire, who for the period of twenty-five years was secretary of the academy. The subject of the essay is, "What Effect has Child-labour on the Growth of the Body?" and the competition is open to all. The essays must reach the Secretary of the American Academy of Medicine by, at latest, January 1, 1921.

The Tin and Tungsten Research Board of the Department of Scientific and Industrial Research invites proposals from firms and individuals in a position to undertake research work with the view of increasing the extraction of tin and tungsten from Cornish ores by the introduction of improved processes. Letters in connection with the announcement should be addressed to the Secretary of the Tin and Tungsten Research Board, 15 Great George Street, Westminster, S.W.1.

We regret to note that the death of Mr. John Paul Wilson is announced in *Engineering* for October 11. Mr. Wilson was the late general manager of Palmer's Shipbuilding and Iron Co., Jarrow-on-Tyne, and was seventy-two years of age at the time of his death, which took place on October 4. He had a long and varied experience in shipbuilding on the Clyde, at Barrow, and on the Tyne, and for a time was shipbuilding director of the Anglo-Spanish yard at Bilbao, which yard he designed and laid out to build 7000-ton armoured cruisers in an unprecedentedly short time.

By an Order of the Minister of Munitions, dated October 11, on and after October 21 no clinical thermometer can be sold which does not bear the approval mark of the National Physical Laboratory. Up to one month from the date of the Order the laboratory will approve thermometers which show no error exceeding 0·4° F, over the scale below 100° F., and after that date such as show no error exceeding 0·2° F. over that range. The charge for testing the thermometers will be 3*d*., and for a small additional charge a certificate giving details of the results of the test of an instrument will be issued.

Several letters have reached us referring to Lord Walsingham's suggestion (Nature, September 5, p. 4) that species proposed in the German language should not be regarded as valid. We do not think any useful purpose would be served by a general discussion of this subject, or by anticipating the confusion in nomenclature which, Dr. W. E. Hoyle points out, would result in the future if it be carried into effect. In the interests of scientific system, Dr. Hoyle suggests that before it is acted upon the proposal should be submitted to the International Commission on Zoological Nomenclature, which was specially established to deal with such question.

The death is announced, in his sixty-ninth year, of Dr. William Kent, who from 1903 to 1908 was Dean of the College of Applied Science at Syracuse University, U.S.A. From 1877 to 1879 Dr. Kent was editor of the *American Manufacturer and Iron World*, from 1895 to 1903 associate editor of *Engineering News*, and from 1910 to 1914 editor of *Industrial Engineering*. He was vice-president of the American Society of Mechanical Engineers from 1888 to 1890, and in 1905 was president of the American Society of Heating and Ventilating Engineers. His publications included "The Strength of Materials," "Strength of Wrought-iron and Chain Cables," and "The Mechanical Engineer's Pocket-book."

According to the *Times*, news has reached Vardö that Capt. Roald Amundsen's Polar expedition in the *Maud* passed Yugor Strait on August 28 and entered the Kara Sea. As was anticipated from previous experience, September proved to be a good month for crossing the Kara Sea. The *Maud* met with no difficulties, and was last heard of by wireless telegraph from Dickson Island at the mouth of the River Yenisei, where she took on board a quantity of petrol and sailed eastward. The expedition has now left the last outpost of civilisation, and, unless news is received from wandering natives in the Taimir peninsula or around the Lena delta, nothing will be heard of the *Maud* for several years.

The Commonwealth Government has now published the official report by Capt. J. K. Davis on the *Aurora* relief expedition to the Antarctic. It will be remembered that the *Aurora* was sent to the Ross Sea to rescue the ten members of the Shackleton expedition left at Cape Evans. The task was accomplished with Capt. Davis's usual skill in handling his ship in difficult ice conditions. Unfortunately, three members of the expedition had lost their lives during the previous winter—Capt. Mackintosh and Messrs. A. P. Spencer-Smith and V. G. Hayward. The *Aurora* left Port Chalmers, N.Z., on December 20, 1916, and returned to Wellington on February 9, 1917, thus making a record voyage to the Antarctic and back. The voyage was, on the whole, uneventful, and no new discoveries were made. A track-chart of the journey accompanies the report.

The first of three Chadwick public lectures on "The Story of a New Disease" was delivered by Dr. F. G. Crookshank on October 10. The subject is the Heine-Medin disease or infantile paralysis, which may assume various forms. The recent cases of so-called botulism (see Nature, vol. ci., pp. 170 and 209) are probably examples of a cerebral form of it. Dr. Crookshank reviewed the history of various mysterious outbreaks of sickness with nervous symptoms recorded since the fifteenth century, and suggested that the key to the understanding of these diverse nervous epidemics is to be found in the description by Willis in 1661 of an "epidemical feavour, chiefly infestous to the brain and nervous stock." This is to be considered in the next lecture on Thursday, October 17, at 5 p.m. (11 Chandos Street, W.1, admission free).

A COMMITTEE has been appointed by Mr. Walter Long to investigate the available sources of supply of alcohol, with particular reference to its manufacture from materials other than those which can be used for food purposes, the method and cost of such manufacture, and the manner in which alcohol should be used for power purposes. The members of the Committee are as follows:—Sir Boverton Redwood, Bart. (chairman); Major Aston Cooper-Key, C.B. (Home Office); Mr. Arnold Philip, Admiralty chemist (Admiralty); Mr. H. F. Carlill (Industrial Power and Transport Department, Board of Trade); Prof. C. Crowther (Board of Agriculture and Fisheries); Dr. J. H. Hinchcliff (Department of Agriculture and Technical Instruction, Ireland) (Irish Office); Sir Frederick Nathan (Ministry of Munitions); Mr. H. W. Garrod (Ministry of Reconstruction); Sir H. Frank Heath, K.C.B. (Scientific and Industrial Research Department); Sir Frederick W. Black, K.C.B.; Prof. Harold B. Dixon, F.R.S.; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Dr. W. R. Ormandy; Mr. E. S. Shrapnell-Smith, C.B.E. (Deputy Director of Technical Investigations in H.M. Petroleum Executive); and Mr. Horace Wyatt (Imperial Motor Transport Council). Mr. Shrapnell-Smith will act as secretary to the Committee, and all communications should be addressed to him at the office of H.M. Petroleum Executive, 12 Berkeley Street, W.1.

WE regret to notice the announcement of the death in France of Lieut. P. M. Chadwick, R.E. Lieut. Chadwick was the son of Mr. and Mrs. Ellis Chadwick, of Parkstone, Dorset, and after a successful career at the City of London School and the Imperial College of Science and Technology, graduated B.Sc. in engineering. He then became in succession an articled pupil of Mr. Bailey Denton, assistant to the chief engineer of the new docks at Southampton, a lecturer at the City and Guilds Technical College, Finsbury, and finally a lecturer in civil engineering in Birmingham University. At Birmingham, under the direction of Prof. F. C. Lea, he made a critical examination of experimental data on the action of centrifugal pumps, and in a paper (published in *Engineering*) he attempted to express the results in the form of a characteristic equation. This work gained for him the James Forrest medal and the Miller prize of the Institution of Civil Engineers and the silver medal of the Birmingham Society of Engineers. He then proceeded to an original experimental investigation of the pressures in centrifugal pumps with the object of testing the theory, embodying the results in a thesis for which he was awarded the degree of M.Sc. in Birmingham University. At the outbreak of war he joined the Birmingham University O.T.C., and in 1915 was given a commission in the East Anglian Divisional Engineers. He saw service with the 54th Division in Gallipoli, and later in France.

THE Tokyo Society of Naval Architects has recently (July, 1918) published the second part of Mr. Shinji Nishimura's "Study of the Ancient Ships of Japan." It deals with the *Hisago-Bune* or "gourd ship." From a comparative study of Japanese and Korean myths and legends, and of the survival of the use of the gourd by certain women who fish for "ear-shells" on the coasts of Korea, Japan, and Chyoi-jyn Island, Mr. Nishimura arrives at the conclusion that in ancient times gourds were used as floats by swimmers and for rendering rafts buoyant. He insists upon the essential identity of these practices with the customs which still persist upon certain of the rivers of India and Mesopotamia, and suggests that the Japanese and Korean "gourd ship" is the Far Eastern modification of a device originally invented upon the banks of the Tigris and Euphrates. The influence of Indian and Egyptian methods of shipbuilding in eastern Asia has long been recognised; and it is of special interest to note that Babylonia has added a definite contribution to this easterly drift of sea-borne culture.

A "RADIOLOGICAL aeroplane" was described by Drs. Nemirowski and Tilmant before the Academy of Medicine of Paris at a meeting on September 3. It contains three places for the pilot, surgeon, and radiographer, and is provided with a generator for Röntgen-rays, one operating-table for operations performed with the aid of the rays, surgical instruments, and medicaments. The "Aerochir," as it is called, is intended to fly over the lines of action, ready to alight and render first aid to the wounded. The invention should be invaluable, provided, however, that it is not regarded by the enemy as a target for his fire.

IN continuation of his "Studies in Paleopathology," Prof. Roy L. Moodie cites numerous cases in which the condition known medically as opisthotonos appears to have set in at the time of death of fossil vertebrates (*American Naturalist*, vol. lii., p. 384, 1918). Some very familiar specimens, such as the Berlin Archæopteryx and the one complete example of Compsognathus, are included. The tetanic spasm has given "a peculiar curve to the backwardly bent neck" in these and other cases. The whole attitude of Osborn's *Struthiomimus altus* in the American Museum, including the contracted toes, provides a powerful example of this contention. The author urges that while some cases may merely represent the final struggle before the moment of death, others strongly suggest a cerebro-spinal or other intracranial infection.

IT is well known that the late Prof. Adam Sedgwick held somewhat unusual views with regard to what is commonly known as the "cell theory," and that these views were largely derived from his own investigation of the early development of *Peripatus capensis.* He maintained that in the young embryo the cell-boundaries were not properly defined—in fact, that the embryo formed a kind of syncytium with embedded nuclei. The precise knowledge which we already possessed of the segmentation of the egg and the formation of the germinal layers in other animals, even at the time he wrote, rendered it highly improbable that Peripatus formed an exception to the general rule; and Miss Edith H. Glen has rendered good service in demonstrating that Sedgwick's observations were inaccurate, and that, by appropriate methods, cell-boundaries can be demonstrated in the early embryo of *Peripatus capensis* as in other cases. Miss Glen's paper, published in the *Quarterly Journal of Microscopical Science* (vol. lxiii., part 2), also refutes Sedgwick's views as to the nature of the nephridia in Peripatus, and confirms the statement of Kennel that, as in the Annelids, they are of ectodermal origin.

IN vol. lxvii. of the *Archives Italiennes de Biologie* Major Gemelli, director of the psycho-physiological laboratory at Padua, gives an interesting account of the methods employed by the Italian authorities in the selection of aviators. As regards the psychological aspect, these are more elaborate than those employed in this country. In addition to the determination of reflex times to visual, auditory, and cutaneous stimuli by the usual methods, a method is employed by which the subject must perform appropriate movements according to the nature of the stimulus given. Graphic records of "emotive reactions" are also taken by means of the pneumograph. In addition, the power of attention, judgment, and observation are tested. Results are also given of observations upon the pulse-rate, arterial pressure, and respiratory rate. These results are generally in accordance with those noted by other observers. As regards the pulse-rate, this is found to accelerate with increasing altitude, but to remain approximately constant while at a certain height. During descent there is at first a slight augmentation of rate, followed by a gradual diminution, but on landing there is always an increased rate compared with that at the beginning of the ascent. In regard to the arterial pressure, it is found during ascent that the systolic pressure first falls slightly and then rises, while the diastolic pressure gradually falls; during descent the systolic pressure falls, while the diastolic pressure again rises. After a flight there is always a hypotension. In rate, respiration follows the pulse, but to a less degree. The author has also made investigations in regard to the composition of the blood of aviators. He has observed an augmentation of the hæmoglobin index and of the number of red corpuscles in most pilots of long experience. As regards the rather vexed question as to whether this is due to a concentration of the blood or to the new formation of red corpuscles, the author inclines to the latter view.

AN abnormal change of air-temperature at Tokyo and Sinagawa on March 20 last is dealt with in the Journal of the Meteorological Society of Japan for August, 1918, by Kôsaku Sigetomi. At Tokyo the thermograph showed a rise of temperature amounting to 6·1° F. in twenty minutes, followed immediately by a sudden fall of 3·8° F. in the next ten minutes, and at the same time at Sinagawa, about $5\frac{1}{2}$ miles south of Tokyo, the air-temperature rose 14° F. in fifty minutes. Such an abrupt change of temperature in so short a time is said to be rare, and on December 19, 1912, the amplitude is said to have been 17·6° F. in about twenty minutes, but it is not noted whether the change was a rise or fall. A weather-chart is given for 2 a.m. March 20 to explain the change of temperature, and it is attributed to the presence of a cyclonic disturbance over the Japan Sea and to the passage of secondary disturbances in the south-western quadrant of the parent disturbance. A diagram is also given showing the records of the thermographs at several stations, with the wind directions at each hour, which shows very different results for stations in the north and in the south of Japan. The movements of cyclonic disturbances in Japan are similar to those followed in the British Isles, and subsidiary cyclonic disturbances are clearly subject to the same laws. In March the normal winds are northerly, with a high barometric pressure over Asia and a low pressure in the North Pacific. Charts for the period dealt with have not yet been received in this country, so that the details given cannot be easily followed or criticised. The occurrence is somewhat similar to the changes of temperature not unusually experienced in parts of the British Isles when a "V"-shaped depression or a line-squall is passing over the country.

ACCORDING to a Press dispatch from Amsterdam (quoted in *Engineering and Mining Journal*, August 10), the discovery that Germany does not hold a world-monopoly of potash comes as a great blow to those economists who thought that Germany could impose her own terms for the supply after the war. The Government has just presented a report to the Reichstag pointing out that Spain has unexpectedly entered the market as a large producer of potash, and urging the German mineowners to organise their forces to meet the new situation.

THE Austrian Treasury (according to a report in the *Zeitschrift des Oesterreichischen Ingenieur- und Architekten-Vereines*, July 26) has decided to continue the investigations on a large scale into the occurrence of mineral oil and natural gas in Hungary, as the experiments recently made with the Eötvös torsion pendulum have given encouraging results. A large sum has been set aside for the work, which will be carried out by a number of geophysicists. The whole of Hungary will be systematically investigated from the point of view of the occurrence of mineral-oil deposits.

NEW regulations have been issued by the Physikalisch-Technische Reichsanstalt (*Elektrotechnische Zeitschrift*, July 4) regarding the testing of electrical meters. The complete outfit consists of transformers and one or more meters. During the testing of the instruments all auxiliary apparatus (power, current, voltage indicators, relays, etc.) that are to be actuated by the transformer in practice must be connected up or replaced by substitute resistances and coils with the correct energy consumption and power factor. If the secondary leads of a current transformer exceed 0·15 ohm, an equivalent resistance must be inserted during test.

CARL GOLDSCHMIDT discusses in *Technik und Wirtschaft* for August the question of the more thorough utilisation of the by-products of coal and lignite in gasworks, slow-combustion plants, extracting plants, etc. He points out that many of the valuable "key" products akin to naphtha are wholly or partially wasted in the processes at present in use. By proper thermal treatment of lignite in suitable plant and the subsequent careful treatment of the resultant products, it should be possible to secure even greater independence of foreign sources of supply of lubricants and of burning and lighting oils in the future.

La Nature of August 24 contains an interesting account of the recent discoveries in the so-called Lyons coalfield, which is, in effect, a concealed extension of the Saint Etienne coalfield on the left bank of the Rhone, south of Lyons. Whilst the first attempts to prove this area date back so far as 1855, it is only within the last few years that the existence of workable seams has been successfully demonstrated. The various borings are described in some detail in the original paper. The results show a long, narrow coalfield or, possibly, a string of small basins. The seams are narrow and the coal measures relatively deep, probably in some cases more than 2000 ft. below the surface. The coal is, however, a gas-coal of excellent quality, and the geographical position of the field, close to an important industrial centre like Lyons, is much in its favour. So far it is not supposed that the output is likely to exceed greatly one million tons per annum. There are, furthermore, indications that oil-shales may also exist in this field.

WE have received from the Board of Agriculture a copy of the Food Production Leaflet No. 53, which deals with the storage of sulphate of ammonia on farms. It is pointed out that, whether the sulphate is stored in bags or loose in a heap, the building in which it is kept should be dry and an efficient protection from rain. Sacks of sulphate of ammonia should be piled on a platform raised 6 in. from the floor, a 3-in. layer of some dry substance being placed beneath the platform to absorb any moisture draining from the sacks. The dry substance may be either castor-meal, rape-meal, bone-flour, or raw-bone meal (which can be afterwards used as fertilisers), but chalk, lime, or basic slag must not be used, as they would liberate ammonia from the sulphate. When the sulphate of ammonia is to be stored in a heap, the floor should first be covered to a depth of 6 in. with one of the absorbent substances mentioned above (failing these, a layer of dry soil, sand, or sawdust may be used). Before being applied to the land the sulphate should be freed from lumps, and may with advantage be passed through a $\frac{1}{4}$-in. riddle. This will not be necessary in the case of "neutral" sulphate (*i.e.* containing less than 0·025 per cent. of free acid), which contains no lumps and does not cake. Farmers are recommended to secure the neutral sulphate wherever possible, as this does not rot the bags, and can, moreover, be applied to the land through a drill.

THE re-awakening of interest in Canada in the shipbuilding and engineering industries some years ago came at an opportune time, in view of the world-war, and the various establishments organised are doing most useful service, both in the production of ships and in the supply of munitions. One of the leading establishments is that of the Canadian Vickers at Montreal, and these works form the subject of articles in *Engineering,* the first of which appeared in the issue for October 11. These works were started in 1910, and had attained full influence on the shipbuilding resources of Canada in 1915. The illustrations of the produce of the yard, which covers thirty-five acres, deal almost exclusively with merchant shipbuilding and high-speed motor-boats, of which a great fleet has been built. The company has also manufactured a large number of projectiles. The great floating dock, which forms such an interesting feature of the establishment, was roofed in so as to provide a workshop for the building of motor-boats, and thirty boats could be in progress simultaneously within the dock, while others were built in other departments on the shore. The transporting of the boats overland to a convenient Atlantic port was accomplished by loading them on exceptionally long and well-trussed trucks, with a four-wheeled bogie at each end, the bow and stern of the boat overhanging. It is not permitted, meanwhile, to enter into details of these boats.

BULLETIN No. 2 of the Department of Scientific and Industrial Research, which deals with cutting lubricants and cooling liquids, and with the skin diseases caused by lubricants, should prove very useful to engineers, although it contains no new work. The information comprised in the first part of the bulletin has been collected by Mr. T. C. Thomsen, who divides cutting lubricants and cooling liquids into the four classes: (1) Soluble oils which form an emulsion when mixed with water, (2) soluble compounds (or cutting compounds), *i.e.* greasy compounds which emulsify with water, (3) cutting emulsions formed by mixing either soluble oils or soluble compounds with water, and (4) cutting oils such as lard-oil, rape-oil, mineral oils, or a mixture of these. The principal uses of these classes of substances are: (*a*) Cooling, (*b*) lubrication, (*c*) to produce smooth finish, (*d*) to wash away chips, and (*e*) to protect from rust or corrosion. Efficient cooling of the tool edge reduces the wear and increases output; it is most apparent with high-speed steel. Lubrication is of little importance in cutting brittle material, but very important where the metal is tough. If cooling and lubrication are efficient, a good finish will result. To produce a perfect finish, cutting oils of great oiliness must be applied. The washing away of chips is frequently an important function, and if the cutting emulsion is too weak it will not be efficiently performed. The important factors to be considered in the selection of cutting lubricants are cutting speed and depth of cut, the material employed, the system of application, and the production of skin diseases. The latter are dealt with by Dr. J. C. Bridge, who describes them as of two kinds: (*a*) Plugging of the glands of the hair follicles, and (*b*) mechanical injury of the skin by metallic particles. The first sets up inflammation round the hair (folliculitis) and may lead to suppuration. For prevention of the diseases cleanliness of the worker and frequent cleaning of the lubricant and machines are recommended. The addition of antiseptics to the lubricant has not proved altogether satisfactory but it has been suggested to sterilise the cutting oil by heat.

WHEN a beam, the weight of which can be neglected, has one end built into a wall and the other end loaded, the flexure of the beam is accompanied by a twist of successive sections with respect to each other unless these sections are symmetrical. The relation between the flexure and torsion has been worked out for beams of certain simple sections by Mr. A. W. Young, Miss E. M. Elderton, and Prof. K. Pearson in a Drapers' Company research memoir recently published. Some of the conclusions have been verified experimentally, and the authors hope that the research will serve as a first step towards the understanding of the relation between flexure and torsion in propeller-blades.

AN article in NATURE of April 18 (vol. ci., p. 138), describing contributions in the Journal of the Scottish Meteorological Society, referred to a chart called a climograph, devised to give a graphic representation of the various climatic conditions. It was stated that "the idea originated with Prof. Huntington," but we learn that this is incorrect. The method is due to Dr. Griffith Taylor, of the Meteorological Bureau, Melbourne, and Prof. Huntington acknowledged its origin and value in a lengthy review in the *Geographical Review* (New York) for November, 1917.

MESSRS. HENRY HOLT AND CO. (New York) give notice of a book by W. Beebe—entitled "Jungle Peace"—resulting from the author's experiences whilst in charge of the tropical research station of the New York Zoological Society in British Guiana. It will be illustrated from photographs.

OUR ASTRONOMICAL COLUMN.

LARGE METEORS.—Dr. F. J. Allen writes from Cambridge that he observed a brilliant meteor on September 27 at 10.7 pass rather slowly across the eastern meridian in a nearly horizontal S. to N. direction at an altitude of about 60°. Another fine meteor was seen from London, W., at 10.15 on the same evening. Mr. Denning observed from Bristol on October 4, 8.43, a large meteor, brighter than Venus, travelling slowly from the N. region of Pegasus into Cygnus. The same object was seen at Totteridge, N., by Mrs. Wilson, and it seems to have been rather low in the atmosphere, the height being from 42 to 31 miles, and the length of path 44 miles. The radiant point was at $13° - 10°$ near